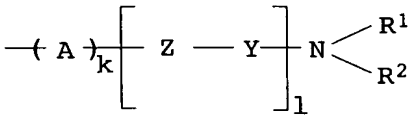
We claim:-

1. A polyisobutenamine of the formula I:

$$R\text{-}X \qquad (I)$$

where R is a polyisobutenyl radical having a number average molecular weight $\bar{M}_N$ of from 500 to 1 500 and a polydispersity $\bar{M}_W/\bar{M}_N$ of less than 1.4 and
X is an organic radical having amino groups.

2. A polyisobutenamine as claimed in claim 1, where X is selected from a radical of the formula II



(II)

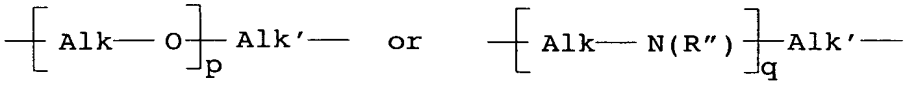
where k and l, independently of one another, are 0 or 1,

A is methylene or phenylene,

Z is oxygen or NR', where

R' is hydrogen, alkyl, hydroxyalkyl, aminoalkyl, cycloalkyl, aryl, aralkyl or a group $-Y-NR^1R^2$,

-Y- is a group



where Alk is C_2-C_4-alkylene, p and q, independently of one another, are an integer from 0 to 25 and R" is hydrogen, alkyl or aryl, and Alk' is alkylene which may be interrupted by 1, 2 or 3 nonneighboring oxygen atoms, or is cycloalkylene,

R^1 and R^2, independently of one another, are hydrogen, alkyl, cycloalkyl, hydroxyalkyl, aryl or aralkyl or a group $Y\text{-}NR^3R^4$, where Y has the abovementioned meanings and R^3 and R^4, independently of one another, are hydrogen, alkyl, cycloalkyl, hydroxyalkyl, aryl or aralkyl, R^3 and R^4 together with the nitrogen atom to which they are bonded form an unsubstituted or substituted, saturated heterocycle which may contain a further hetero atom selected from oxygen and nitrogen,

R^1 and/or R^2 may also be R or $-CH_2\text{-}R$ if l is 0, R having the abovementioned meaning, or

R^1 and R^2 together with the nitrogen atom to which they are bonded form an unsubstituted or substituted, saturated heterocycle which may contain a further hetero atom selected from oxygen and nitrogen.

3. A polyisobutenamine as claimed in claim 2, where R^1 and R^2, independently of one another, are selected from hydrogen, C_1-C_6-alkyl, phenyl, 2-hydroxyethyl, 2-aminoethyl, 3-aminopropyl, 2-di(C_1-C_4-alkyl)aminoethyl, 3-di(C_1-C_4-alkyl)aminopropyl or radicals of the formulae $[CH_2\text{-}CH_2\text{-}O]_{p'}\text{-}CH_2\text{-}CH_2OH$ and $[CH_2\text{-}CH_2\text{-}NH]_{q'}\text{-}CH_2\text{-}CH_2NH_2$, or where NR^1R^2 is a piperidine, piperazine, N-(C_1-C_4-alkyl)piperazine or morpholine radical and p' and q', independently of one another, are from 1 to 20.

4. A process for the preparation of a polyisobutenamine of the formula I as claimed in any of the preceding claims, wherein

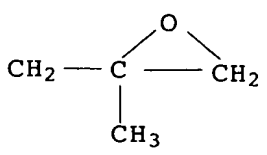
i) isobutene is polymerized in the presence of an initiator system comprising

a) a Lewis acid selected from covalent metal chlorides and semimetal chlorides,

b) and at least one compound of the formula III,

$CH_3\text{-}C(CH_3)_2\text{-}[CH_2\text{-}C(CH_3)_2]_m\text{-}FG$

where m is 0, 1, 2, 3 or 4 and FG is halogen, OH, alkoxy, acyloxy, $CH_2C(CH_3)CH_2OH$ or a group



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in a solvent which is inert with respect to the Lewis acid, at a molar ratio of Lewis acid to compound III of from 5:1 to 1:20, to give a polyisobutene which contains at least 80 mol % of olefinic terminal groups and has a number average molecular weight $\overline{M}_N$ of from 500 to 1 300 and a polydispersity $\overline{M}_W/\overline{M}_N$ of less than 1.4, and

ii) a radical having amino groups is introduced in a manner known per se at the olefinic double bonds of the polyisobutene obtained in step i).

5. A process as claimed in claim 4, wherein the compound III is used in an amount of from 0.02 to 0.3 mol per mole of isobutene.

6. A process as claimed in claim 4 or 5, wherein the Lewis acid is selected from titanium(IV) chloride and boron trichloride.

7. A process as claimed in any of the preceding claims, wherein the initiator system additionally contains at least one aprotic polar compound IV which is suitable for complex formation with the Lewis acid or with the carbocation formed under reaction conditions or the cationogenic complex of Lewis acid and compound III.

8. A process as claimed in claim 7, wherein the compound IV is selected from pyridine, alkylpyridines and nonpolymerizable, aprotic organosilicon compounds having at least one Si-O bond.

9. A process as claimed in either of claims 7 and 8, wherein the compound IV and the compound III are used in a molar ratio of IV:III of from 1:1 to 1:1 000.

10. A process as claimed in any of claims 4 to 9, wherein the solvent for the polymerization is selected from hydrocarbons of 2 to 10 carbon atoms, inert halohydrocarbons of 1 to 3 carbon atoms and mixtures thereof.

11. A process as claimed in any of claims 4 to 10, wherein the solvent is removed at temperatures of at least 150°C in order to obtain the polyisobutenes.

12. A process as claimed in any of claims 4 to 11, wherein the functional group X in step ii) is introduced by reaction of the polyisobutene obtained in step i), according to one of

the following processes (1) to (7), and, if required, a subsequent alkoxylation:

(1) hydroformylation of the polyisobutene with subsequent reductive amination of the hydroformylation product in the presence of ammonia, amines or amino alcohols and hydroformylation of the polyisobutene in the presence of ammonia, amines or amino alcohols under reducing conditions;

(2) hydroboration of the polyisobutene with subsequent oxidative cleavage of the borane adduct and subsequent reductive amination in the presence of ammonia, amines or amino alcohols;

(3) hydroboration or hydroformylation under reducing conditions to give a polyisobutenyl alcohol, followed by an alkoxylation and a reductive amination in the presence of ammonia, amines or amino alcohols;

(4) reaction of the polyisobutene with a nitrogen oxide-containing oxidizing agent and subsequent reduction of the NO_x groups thus introduced to NH_2 groups;

(5) epoxidation of the polyisobutene and subsequent reaction of the epoxidation product with ammonia, an amine or an amino alcohol with subsequent or simultaneous elimination of water and catalytic reduction;

(6) hydrocyanation of the polyisobutene under acidic catalysis and subsequent hydrolysis in a Ritter reaction or

(7) reaction with phenol under Friedel-Crafts conditions and subsequent reaction of the polyisobutenylphenol with formaldehyde and amine in a Mannich reaction.

13. The use of a polyisobutenamine as claimed in claim 1 as detergent additive in fuel compositions.

14. An additive concentrate containing at least one polyisobutenamine as claimed in claim 1 in amounts of from 0.1 to 80% by weight, in addition to conventional additive components.

15. A fuel composition containing a principal amount of a liquid hydrocarbon fuel and a detergent-active and/or viscosity-improving amount of at least one polyisobutenamine as claimed in claim 12.